Claims

1. Demultiplexer for an optical time-division multiplexed digital signal that has a signal wavelength λ_s and is transmitted with a bit rate B, comprising:

   - a Raman active optical medium,

   - a pump source for generating a periodic optical pump signal having a pump wavelength λ_p and a periodicity of B/n where n is an integer $\geq$ 2, and

   - a coupler for coupling the digital signal and the pump signal into the Raman active optical medium.

2. The demultiplexer of claim 1, wherein the signal wavelength λ_s is larger than the pump wavelength λ_p so that the demultiplexed signal is ampflified.

3. The demultiplexer of claim 2, wherein the difference between the signal wavelength λ_s and the pump wavelength λ_p is chosen such that the Raman gain of the optical medium is at its maximum.

4. The demultiplexer of claim 1, wherein the signal wavelength λ_s is smaller than the pump wavelength λ_p so that the demultiplexed signal is attenuated.

5. The demultiplexer of claim 1, characterized by tunable delay means for tuning the phase relationship between the pump signal and the digital signal.

6. The demultiplexer of claim 5, wherein the delay means is arranged between the pump source and the coupler.

7. The demultiplexer of claim 1, comprising an optical filter which has a stop band containing the pump wavelength λ_p and which is arranged, in the propagation direction of the signals, behind the Raman active optical medium.

8. Method for demultiplexing an optical digital signal having a bit rate B, comprising the steps of:

- generating a periodic optical pump signal having a periodicity of B/n where n is an integer ≥ 2,

- coupling the digital signal and the pump signal into a Raman active optical medium.

9. The method of claim 8, wherein the pump signal and the digital signal are phase matched such that maxima of the pump signal match bit positions in the digital signal.